TUTOR TIME®

January 17, 2002

Dear Parents of Mineola Tutor Time,

As you know the health and safety of children is always our first priority. It has recently come to our attention that there may be a possibility that our air quality could be affected by the Jackson Steel facility down the street. Air quality tests were conducted and revealed levels of tetrachloroethene (PCE) in some areas of our building.

The test results indicate readings that range from 49 – 260 micrograms per cubic meter (ug/m3). We have attached a fact sheet from the New York State Health Department which will provide more information about the nature of the substance detected.

We are immediately installing a system to work along with our Heating Ventilation Air Conditioning system to bring fresh air into the building and introduce positive air pressure. These steps should reduce the levels of PCE. We have been in touch with both the EPA and the Nassau County Health Department which agree that this would be a good preventative measure. The USEPA is evaluating the Jackson Steel facility and a soil ventilation system may be installed to help even further.

Here are some contacts that you can feel free to speak with if you have any further questions: Jacquelyn Nealon, Public Health Specialist 1-800-458-1158 ext. 27880 or Lou DiGuardia, Response branch EPA 732-906-6927.

Please also feel free to speak with your Center Director who is available at all times.

Again, please know that we are being pro-active in handling this matter. We will keep you informed as changes arise.

Sincerely,

Mark Schiller, President

One Park Place • 621 N.W. 53rd Street/Suite 450 • Boca Raton, FL 33487
800/275-1235 • 561/994-6226 • FAX # 561/994-2778

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FACT SHEET

TETRACHLOROETHENE (PERC) IN INDOOR AND OUTDOOR AIR

OCTOBER 1997

This fact sheet answers a few questions about a chemical called tetrachloroethene (PERC), which is widely used to dry clean clothes. It provides information on health effects seen in humans and animals exposed to PERC in air. It also provides information about the New York State Department of Health (NYSDOH) guideline of 100 micrograms per cubic meter of air (100 $\mu g/m^3$). The fact sheet focuses on the health risks from air exposures because most of the PERC released into the environment goes into air.

Prepared by

New York State Department of Health

JOE DEFRANCO HVAC CLASS.COM

1. WHAT IS TETRACHLOROETHENE (PERC)?

Tetrachloroethene is a manufactured chemical that is widely used in the dry cleaning of fabrics, including clothes. It is also used for degreasing metal parts and in manufacturing other chemicals. Tetrachloroethene is found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors. Other names for tetrachloroethene include PERC, tetrachloroethylene, perchloroethylene, and PCE. PERC is a commonly used name and will be used in the rest of the fact sheet.

PERC is a nonflammable, colorless liquid at room temperature. It readily evaporates into air and has an ether-like odor. Because most people stop noticing the odor of PERC in air after a short time, odor is not a reliable warning signal of PERC exposure.

2. HOW CAN I BE EXPOSED TO PERC?

People are exposed to PERC in air, water, and food. Exposure can also occur when PERC or material containing PERC (for example, soil) gets on the skin. For most people, almost all exposure is from PERC in air.

PERC gets into outdoor and indoor air by evaporation from industrial or dry-cleaning operations and from areas where chemical wastes are stored or disposed. Groundwater near these areas may become polluted if PERC is improperly dumped or leaks into the ground. PERC may get into indoor air after PERC-products, such as spot removers, are used. Indoor air levels in air may get high if PERC-products are used in poorly ventilated areas. It can also evaporate from polluted drinking water into indoor air during cooking and washing.

3. HOW DOES PERC ENTER AND LEAVE MY BODY?

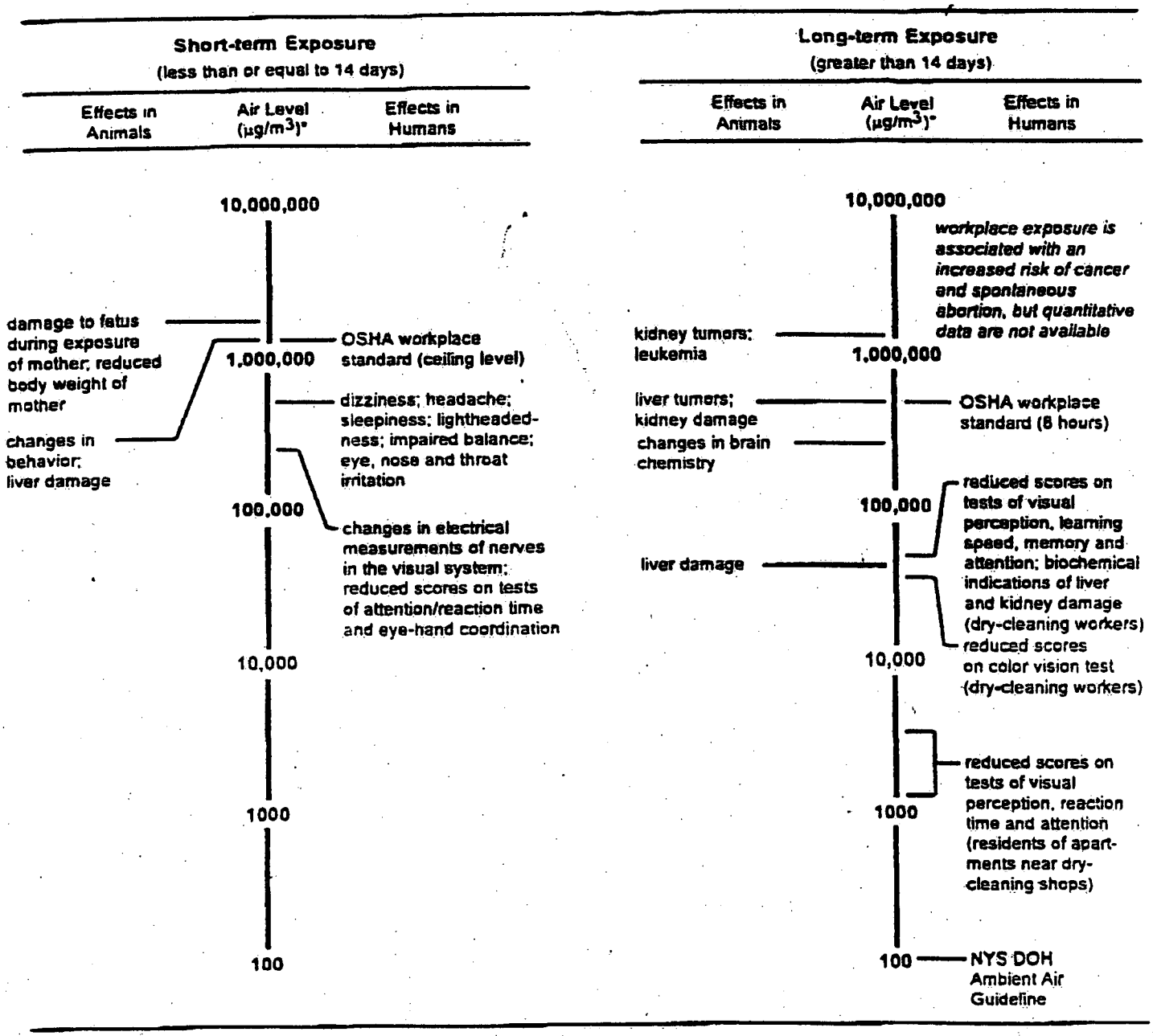
When people breathe air containing PERC, the PERC is taken into the body through the lungs and passed into the blood, which carries it to all parts of the body. A large fraction of this PERC is breathed out, unchanged, through the lungs into the air. Some of this PERC is stored in the body (for example, in fat, liver, and brain) and some is broken down in the liver to other compounds and eliminated in urine. PERC can also be found in breastmilk. Once exposure stops, most of the PERC and its breakdown products leave the body in several days. However, it may take several weeks for all of the PERC and its breakdown products to leave the body.

4. WHAT KINDS OF HEALTH EFFECTS CAN BE CAUSED BY EXPOSURE TO PERC IN AIR?

The strength (potency) of PERC to cause health effects is low, but breathing air with high levels of PERC can damage many parts of the body. In humans and animals, the major effects of exposure are on the central nervous system, kidney, liver, and possibly the reproductive system.

The health effects of PERC depend on the level and length of exposure. Figure 1 shows the types of health effects seen in humans and animals and the lowest levels of PERC in air at which the effects were seen. The diagram on the right side of the figure shows the effects of long-term exposures in humans and animals whereas the diagram on the left side shows the same information for short-term exposures. Because there is a large amount of information on the human effects of PERC, the rest of the fact sheet will discuss only the human data.

Figure 1. Health Effects from Breathing Tetrachloroethene (Perc). The diagram shows the effects observed in humans and animals exposed to specific measured levels of tetrachloroethene in air. The diagram contains information on the effects observed after short-term (left-side of figure) and long-term (right side of figure) exposure. Federal workplace standards (set by the Occupational Safety and Health Administration or OSHA) are also shown on the diagram.



*Effects are listed at the lowest level (micrograms per cubic meter of air (µg/m^3)) at which they were first observed. They may also be seen at higher levels.

Guideline = 100 µg/m^3 (micrograms/m^3) = 0.015 ppm (parts per million) = 15 ppb (parts per billion)

August, 1998

Not all humans exposed showed effects at the levels given in Figure 1. Some did and some did not. This difference was due, in part, to the individual differences among humans. People, for example, differ in age, sex, diet, family traits, lifestyle, and state of health. These differences can affect how people will respond to a given exposure. One person may feel fine during and after an exposure while another person may become sick. This is known as sensitivity. Differences in sensitivity should be kept in mind when examining the following information on the human health effects of PERC.

Studies with volunteers show that short-term exposures of 8-hours or less to 700,000 micrograms per cubic meter ($\mu g/m^3$) cause central nervous system symptoms such as dizziness, headache, sleepiness, lightheadedness, and poor balance (Figure 1). Exposures to 350,000 $\mu g/m^3$ for 4 hours affected the nerves of the visual system and reduced scores on certain behavioral tests (which, for example, measure the speed and accuracy of a person's response to something they see on a computer screen). These effects were mild and disappeared soon after exposure ended.

Studies of dry cleaning workers indicate that long-term exposure (9 - 20 years, for example) to workplace air levels averaging about 50,000 $\mu g/m^3$ to 80,000 $\mu g/m^3$ reduces scores on behavioral tests and causes biochemical changes in blood and urine (Figure 1). The biochemical changes indicate liver and kidney damage. The effects were mild and hard to detect. How long the effects would last if exposure ended isn't known.

There is only one study of long-term exposure to air levels lower than in the workplace. The study reported reduced scores on behavioral tests in healthy adults living (for 10.6 years, on average) in apartments near dry cleaning shops (Figure 1). The effects were small; the average test scores of the residents were slightly lower than that of unexposed people. The average air level in all apartments was 5,000 $\mu g/m^3$ and the median was 1,400 $\mu g/m^3$ (that is, half the measured air levels were above 1,400 $\mu g/m^3$ and half were below it).

Some studies show a slightly increased risk of cancer and reproductive effects among workers exposed to PERC, including dry cleaning workers. The cancers associated with exposure included cancers of the esophagus and cervix and non-Hodgkin's lymphoma. The reproductive effects associated with exposure included increased risks of spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by PERC and not by some other factor or factors. These studies provided some (cancer studies) or no data (studies on reproduction) on workplace air levels; however, workplace air levels are often considerably higher than those found in outdoor air or indoor air of homes or apartments.

5. WHAT IS THE NEW YORK STATE DEPARTMENT OF HEALTH'S (NYSDOH) GUIDELINE FOR PERC IN AIR?

NYSDOH recommends that the average air level in a residential community not exceed 100 micrograms of PERC per cubic meter of air (100 $\mu g/m^3$), considering continuous lifetime exposure and sensitive people. Three other ways of expressing the guideline are 0.1 milligrams per cubic meter of air

(mg/m^3), 0.015 parts per million (ppm) and 15 parts per billion (ppb).

The guideline can be used to guide decisions about actions to reduce human exposures to PERC. NYSDOH recommends, for example, that actions to reduce exposure should be considered when an air level is above the guideline. NYSDOH also recommends that the need to take immediate action to reduce exposure should be considered when an air level is ten-times or more higher than the guideline (that is, when the air level is 1,000 $\mu g/m^3$ or higher). The specific corrective actions to be taken depends on a case-by-case evaluation of the situation. In all cases, however, the NYSDOH also recommends that simple, common sense actions to reduce exposure (such as covering open containers of PERC) should be taken even if an air level is below 100 $\mu g/m^3$.

6. SHOULD I BE CONCERNED ABOUT HEALTH EFFECTS IF I AM EXPOSED TO AN AIR LEVEL SLIGHTLY ABOVE THE GUIDELINE?

The guideline of 100 $\mu g/m^3$ is not a line between air levels that cause health effects and those that do not. The guideline is much lower than the air levels that caused either non-cancer or cancer effects (see Figure 1). Thus, the possibility of health effects is low even at air levels slightly above the guideline.

In addition, the guideline is based on the assumption that people are continuously exposed to PERC in air all day, every day for as long as a lifetime. This is rarely true for most people, who are more likely to be exposed for a part of the day and part of their lifetime. This difference between assumed exposure and actual exposure should also be considered when air levels are slightly above the guideline.

In summary, measured air levels that are slightly higher than the guideline are not automatically cause for concern, but suggest the need to consider actions to reduce exposure.

7. WHEN SHOULD I OR MY CHILDREN SEE A PHYSICIAN?

If you believe you or your children have symptoms that you think are caused by PERC exposure, you and your children should see a physician. You should tell the physician about the symptoms and about when, how, and for how long you think you and/or your children were exposed to PERC.

8. WHERE CAN I GET MORE INFORMATION?

If you have any questions about the information in this fact sheet or would like to know more about PERC, please call the New York State Department of Health at 1-800-458-1158 extension 2-7810 or write to the following address.

New York State Department of Health
Bureau of Toxic Substance Assessment
Flanigan Square, Room 330
547 River Street
Troy, NY 12180-2216

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